AMENDMENTS TO THE CLAIMS

Please amend the claims as follows:

1-13. (Cancelled)

14. (Currently Amended) The method ~~The process~~ for producing a fine carbon fiber as described in claim ~~13~~35, wherein ~~the fine carbon fiber is collected from the reacted gas by the second fine carbon fiber separating and collecting apparatus, and then a part~~only a portion of the reacted gas is cooled by the second reacted gas-cooling apparatus.

15. (Currently Amended) The method ~~The process~~ for producing a fine carbon fiber as described in claim ~~13~~35, wherein ~~the fine carbon fiber is collected from the reacted gas by the second fine carbon fiber separating and collecting apparatus, and then the total amount~~all of the reacted gas is cooled by the second reacted gas-cooling apparatus.

16. (Currently Amended) The method ~~The process~~ for producing a fine carbon fiber as described in ~~any of~~ claim ~~12~~33, wherein 20 % or more of the reacted gas is recycled.

17. (Currently Amended) The method ~~process~~ for producing a fine carbon fiber as described in ~~any of~~ claim ~~13~~35, wherein 20 % or more of the reacted gas is recycled.

18. (Currently Amended) The method ~~process~~ for producing a fine carbon fiber as described in ~~any of~~ claim 14, wherein 20 % or more of the reacted gas is recycled.

19. (Currently Amended) The method ~~process~~ for producing a fine carbon fiber as described in ~~any of~~ claim 15, wherein 20 % or more of the reacted gas is recycled.

20. (Currently Amended) The method ~~process~~ for producing a fine carbon fiber as described in claim ~~16~~33, wherein 50 % or more of the reacted gas is recycled.

21. (Currently Amended) The method ~~process~~ for producing a fine carbon fiber as described in claim ~~17~~35, wherein 50 % or more of the reacted gas is recycled.

22. (Currently Amended) The method ~~process~~ for producing a fine carbon fiber as described in claim 14~~18~~, wherein 50 % or more of the reacted gas is recycled.

23. (Currently Amended) The method ~~process~~ claim ~~19~~15, wherein 50 % or more of the reacted gas is recycled.

24. (Cancelled)

25. (Currently Amended) The apparatus ~~process~~ for producing a fine carbon fiber as described in ~~any of~~ claim ~~13~~36, wherein the second reacted gas-cooling apparatus comprises a mechanism in which the reacted gas is cooled to a temperature between 40°C ~~or higher to~~ and150°C, inclusive, ~~or lower~~ and then separated by a filter.

26. (Currently Amended) The method ~~process~~ for producing a fine carbon fiber as described in ~~any of~~ claim ~~13~~35, wherein the moisture separator uses at least one of the ~~method~~ techniques of: distillation, adsorption and membrane separation.

27. (Currently Amended) The ~~process~~ method for producing a fine carbon fiber as described in ~~any of~~ claim ~~12~~33, wherein the fine carbon fiber has a fiber diameter ~~of~~ between 0.1 nm ~~or more to~~and 1 □ ~~m~~nm, inclusive ~~or less~~.

28. (Currently Amended) The ~~process~~ method for producing a fine carbon fiber as described in ~~any of~~ claim ~~13~~35, wherein the fine carbon fiber has a fiber diameter ~~of~~ between 0.1 nm ~~or more to~~and 1 ~~□ m or less~~nm, inclusive.

29. (Currently Amended) The ~~process~~ method for producing a fine carbon fiber as described in ~~any of~~ claim 26, wherein the fine carbon fiber comprises a single-walled carbon nanotube ~~in which~~with a fiber diameter ~~is at least~~of 5 nm or less and which has an axial chiral structure.

30. (Currently Amended) The ~~process~~ method for producing a fine carbon fiber as described in ~~any of~~ claim 27, wherein the fine carbon fiber comprises a single-walled carbon nanotube ~~in which~~with a fiber diameter ~~is at least~~of 5 nm or less and which has an axial chiral structure.

31. (Currently Amended) The ~~process~~ method for producing a fine carbon fiber as described in ~~any of~~ claim 26, wherein the fine carbon fiber comprises a multi-walled carbon nanotube ~~in which~~with a fiber diameter ~~is at least~~of 10 nm or less and which has an axial chiral structure.

32. (Currently Amended) The ~~process~~ method for producing a fine carbon fiber as described in ~~any of~~ claim ~~26~~27, wherein the fine carbon fiber comprises a multi-walled carbon nanotube ~~in which~~ with a fiber diameter ~~is at least~~of 10 nm or less and which has an axial chiral structure.

33. (New) A method of producing a fine carbon fiber, said method comprising:

thermally decomposing at least one organic compound containing an IUPAC group 16 periodic table element, using ultra fine particles of at least one transition metal as a catalyst;

collecting fine carbon fiber resulting from said thermal decomposition from reacted reaction gas with a first fine carbon fiber-separating and collecting apparatus;

collecting fine carbon fiber resulting from said thermal decomposition from said reacted reaction gas passing through a reacted gas-cooling apparatus with a second fine carbon fiber-separating and collecting apparatus; and

recycling part of the reacted gas through a gas-recycling apparatus for subsequent thermal decomposition cycles.

34. (New) An apparatus for producing a fine carbon fiber by a method of thermal decomposition of at least one organic compound containing an IUPAC group 16 periodic table element, using ultra fine particles of at least one transition metal as a catalyst, the apparatus comprising:

a raw material gas-feeding part,

a carrier gas-feeding part,

a reaction furnace,

a first fine carbon fiber-separating and collecting apparatus,

a fine carbon fiber tank,

a reacted gas-cooling apparatus,

a second fine carbon fiber-separating and collecting apparatus, and

a gas-recycling apparatus, wherein the fine carbon fiber is collected from the reacted gas passing through the fine carbon fiber-separating and collecting apparatus and the reacted gas-cooling apparatus by the second fine carbon fiber-separating and collecting apparatus, and then a part of the reacted gas is recycled by the gas-recycling apparatus.

35. (New) A method for producing a fine carbon fiber, said method comprising:

decomposing at least one organic compound containing an IUPAC group 16 periodic table element, using a ultra fine particles of at least one transition metal as a catalyst;

collecting fine carbon fiber from reacted reaction gas passing through a first fine carbon fiber-separating and collecting apparatus and a reacted gas-cooling apparatus with a second fine carbon fiber-separating and collecting apparatus;

cooling the reacted reaction gas after collecting with a second reacted gas-cooling apparatus to separate condensate from said gas; and

recycling said gas with a gas-recycling apparatus, wherein water and high boiling point by-products are separated from the condensate by a moisture separator to further recycle unreacted raw material organic compound.

36. (New) An apparatus for producing a fine carbon fiber by a method of decomposition of at least one organic compound containing an IUPAC group 16 periodic table element, using ultra fine particles of at least one transition metal as a catalyst, the apparatus comprising:

a raw material gas-feeding part,

a carrier gas-feeding part,

a reaction furnace,

a first fine carbon fiber-separating and collecting apparatus,

a fine carbon fiber tank,

a reacted gas-cooling apparatus,

a second fine carbon fiber-separating and collecting apparatus,

a gas-recycling apparatus,

a second reacted gas-cooling apparatus,

a condensate tank and a moisture separator, wherein the fine carbon fiber is collected from reacted reaction gas passing through the first fine carbon fiber-separating and collecting apparatus and the reacted gas-cooling apparatus by the second fine carbon fiber-separating and collecting apparatus, and then the reacted gas is cooled by the second reacted gas-cooling apparatus to separate condensate, after which the cooled, reacted gas is recycled by the gas-recycling apparatus, and further wherein water and unwanted by-products are further separated from the condensate by the moisture separator to enable the re-gasification and recycling of unreacted compound remaining in said further separated condensate.